

Progress Report: December 2020



BRIEF INFORMATION

Project title	Impacts of Logging on Terrestrial Mammals in the Tropical Forests of Sarapiquí, Costa Rica
Project ID	28321-1
Project type	1 st Rufford Small Grant
Reporting date	December 2020
Project leader	Hector Alexis Luque Machaca

Field Surveys

During the first stage of project implementation, we began our field work by identifying the sampling units; that is, the forests with different timespans of regeneration after harvesting. In each sampling unit we installed a camera trap and made measurements of the structural attributes of each forest such as DBH, richness of tree species, number of saplings and pole stage trees, percentage of leaf litter, and amount of light under the forest canopy. However, we were forced to put our activities on hold during the first weeks of January due to a period of heavy rains, and again between mid-March and May due to health restrictions imposed by the Costa Rican government due to the SARS-CoV-2 pandemic. After this time, we resumed our activities in the field optimally.

A video explaining the data collection process can be found here:

<https://www.youtube.com/watch?v=doiRYTKveqM>

In the lab, we identified locations for the camera trap sites. We then established buffers with radii of 1 km and 1.8 km in order to obtain the following landscape metrics: percentage of forest cover, distance to towns, density of roads, distance to protected areas, and landscape heterogeneity (Figure 1). Using these landscape metrics, as well as the information gathered from the measurements of the forest structure and the camera traps, we carried out our richness and occupancy analyses at the local and landscape scale.

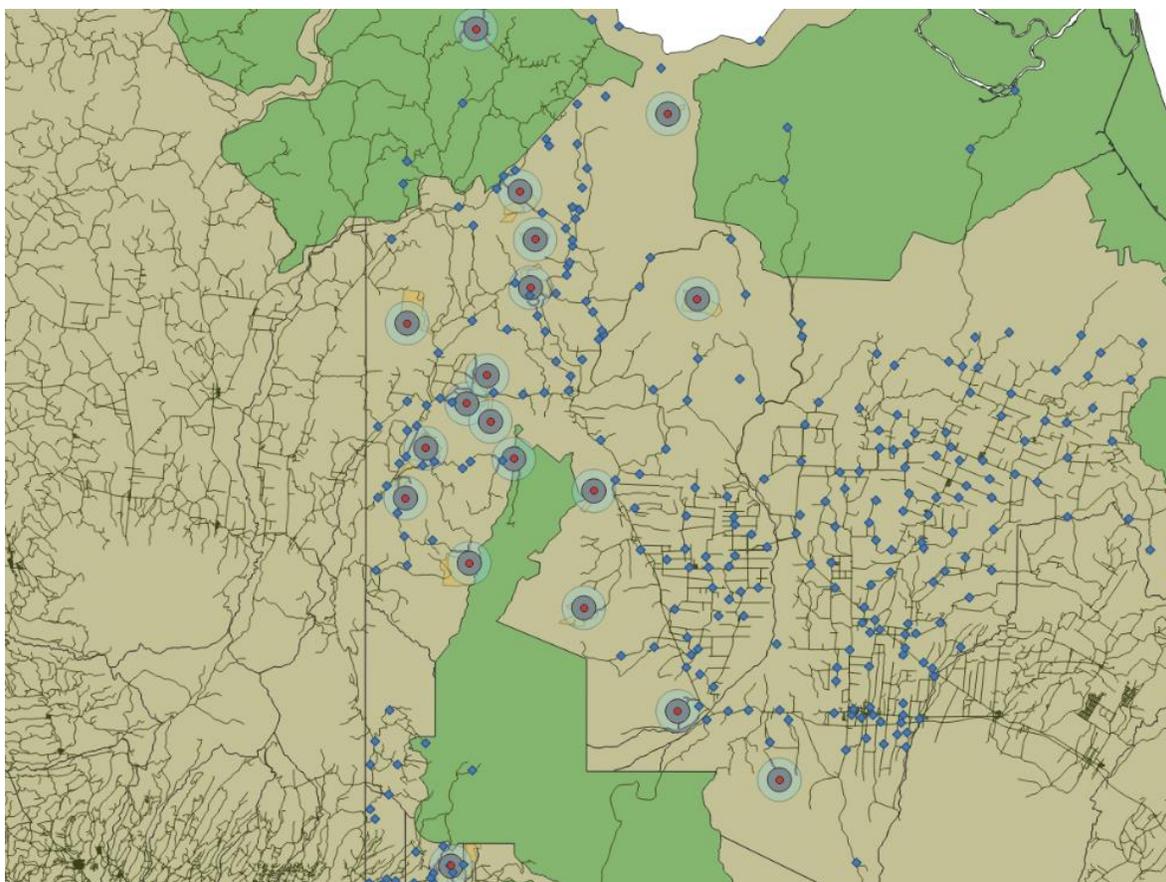


Figure 1. Location of the camera traps (red points) and buffers with 1 km and 1.8 km radii. The green polygons are protected areas.

Although we had a setback of approximately 3 months of the data collection in the field, this did not affect the digitization of the data. However, the data analysis process was delayed due to the pandemic, as I was unable to meet with my thesis committee to define and refine the theoretical and statistical aspects of my project.

Preliminary results

In our study units we recorded a total of 18 species of large and medium-sized wild mammals, and one non-native predator (*Canis lupus familiaris*). The wild species were distributed in 14 families within 8 taxonomic orders (Table 1).

Order	Family	Species
Carnivora	Felidae	<i>Panthera onca</i> (Linnaeus, 1758)
		<i>Puma concolor</i> (Linnaeus, 1771)
		<i>Leopardus pardalis</i> (Linnaeus, 1758)
		<i>Leopardus tigrinus</i> (Schreber, 1775)
	Canidae	<i>Canis lupus familiaris</i> Linnaeus, 1758
		<i>Canis latrans</i> Say, 1823
Mephitidae	<i>Conepatus semistriatus</i> (Boddaert, 1785)	
Procyonidae	<i>Nasua narica</i> (Linnaeus, 1766)	
Mustelidae	<i>Eira barbara</i> (Linnaeus, 1758)	
Didelphimorphia	Didelphidae	<i>Philander opossum</i> (Linnaeus, 1758)
		<i>Didelphis marsupialis</i> Linnaeus, 1758
Rodentia	Dasyproctidae	<i>Dasyprocta punctata</i> Gray, 1842
	Cuniculidae	<i>Cuniculus paca</i> (Linnaeus, 1766)
Lagomorpha	Leporidae	<i>Sylvilagus brasiliensis</i> (Linnaeus, 1758)
Artiodactyla	Tayassudidae	<i>Pecari tajacu</i> (Linnaeus, 1758)
	Cervidae	<i>Mazama americana</i> (Erxleben, 1777)
Perissodactyla	Tapiridae	<i>Tapirella bairdii</i> (Gill, 1865)
Pilosa	Myrmecophagidae	<i>Tamandua mexicana</i> (Saussure, 1860)
Cingulata	Dasypodidae	<i>Dasyopus novemcinctus</i> Linnaeus, 1758

I am currently adjusting the statistical analyses to determine the occupancy and species richness, considering the imperfect detectability of the species in all the sampling units. This will also assist with the analyses at the local scale (forest structure) and landscape scale (landscape metrics).

Additional results

I have also carried out a systematic review of the scientific literature on the effects of reduced impact forest logging and conventional logging on the assemblage of terrestrial mammals in the tropical forests of the world (Figures 2, 3, and 4).

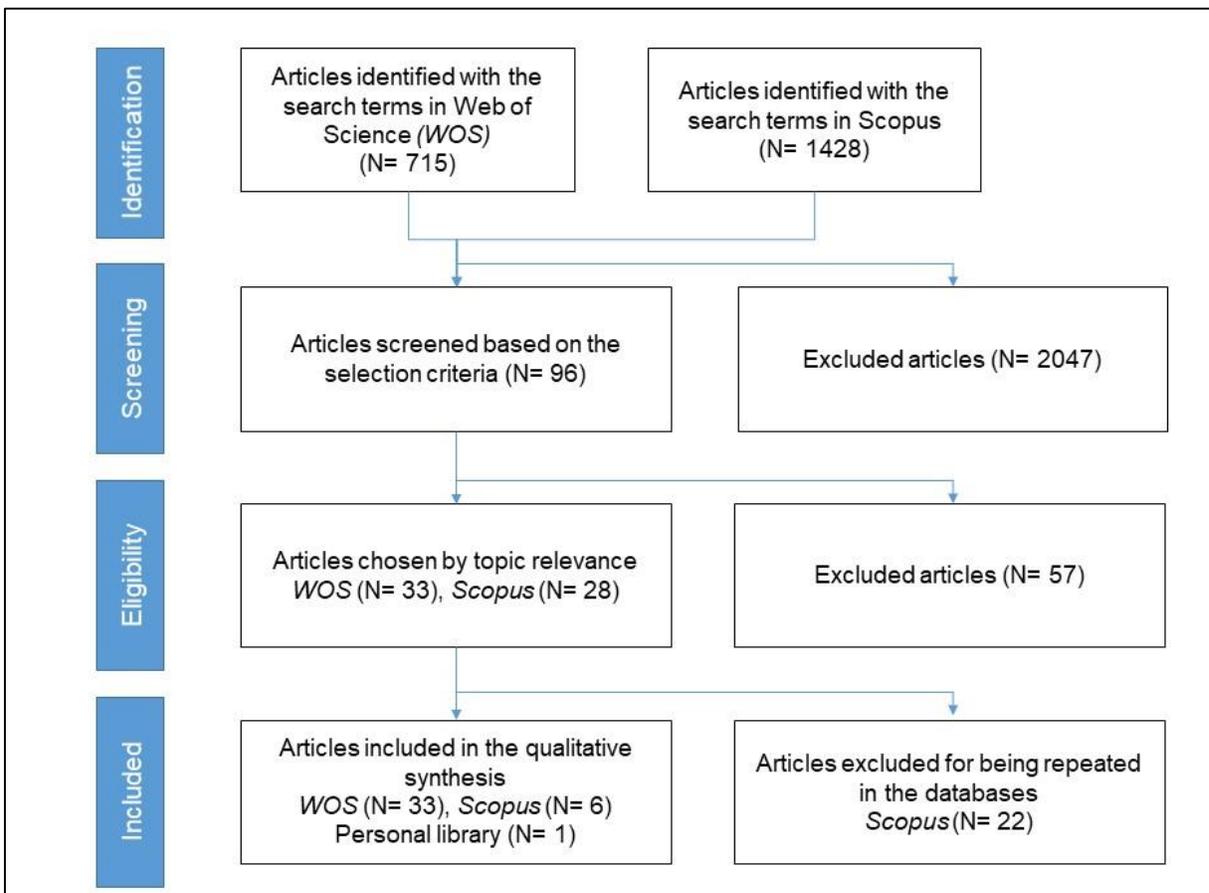


Figure 2. Criteria and screening procedures used for the systematic review.

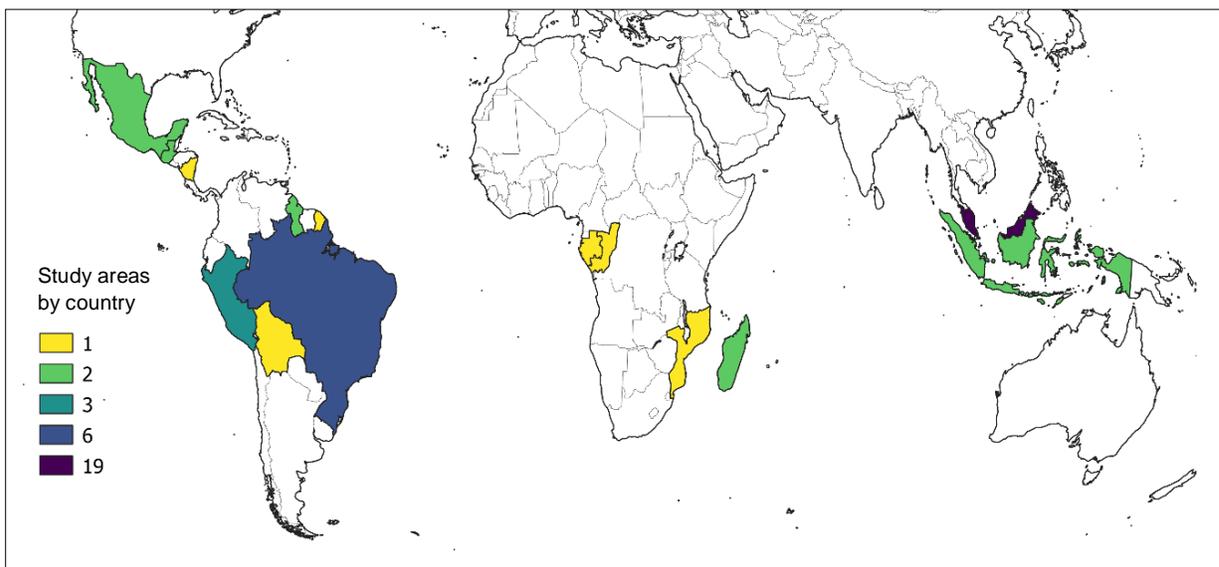


Figure 3. Global distribution of studies that evaluated the responses of terrestrial mammals to forest logging.

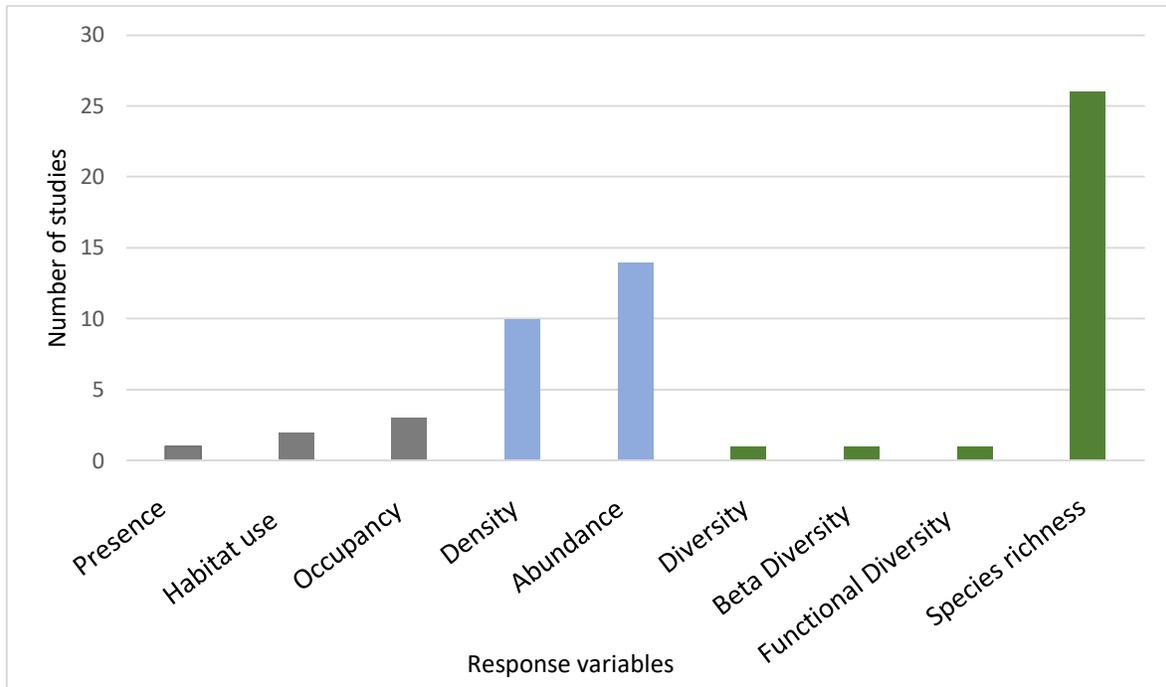


Figure 4. Ecological parameters used to evaluate the responses of mammals to forest harvesting.